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09/977,646	10/15/2001	Saverio Mascolo	U 013666-5	3228

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EXAMINER

CHANKONG, DOHM

ART UNIT	PAPER NUMBER
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2152

DATE MAILED: 02/03/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/977,646

Applicant(s)

MASCOLO, SAVERIO

Examiner

Dohm Chankong

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3,5-12,16 and 17 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☐ Claim(s) ____ is/are rejected.
- 7) ☒ Claim(s) 4 and 13-15 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

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DETAILED ACTION

- 1> Claims 1-17 are presented for examination.

Information Disclosure Statement

- 2> The information disclosure statement filed 10.15.2001 fails to comply with 37 CFR 1.98(a)(2), which requires a legible copy of each cited foreign patent document; each non-patent literature publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed. It has been placed in the application file, but the information referred to therein has not been considered.

Allowable Subject Matter

- 3> Claims 4 and 13-15 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim Rejections - 35 USC § 103

- 1> The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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1> Claims 1, 3, 5-8, 10 and 12 are rejected under 35 U.S.C § 103(a) as being unpatentable over Sinha et al, "WTCP: A Reliable Transport Protocol for Wireless Wide-Area Networks" [Sinha], in view of Zhao et al, U.S Patent No. 6,144,639 ["Zhao"].

2> Sinha discloses an end-to-end estimation of the bandwidth available in a client-server connection established over a packet switching network, comprising:

a routine to compute samples of available bandwidth by taking into account packets received by the client, if the routine is implemented at the receiver side, or by taking into account acknowledgement packets received by the sender, if the routine is implemented at the sender side [see '3.1 Congestion Control (number 4)' | '3.2 Reliability' | '4 The WTCP Algorithm'].

Sinha does not explicitly disclose a routine that implements a discrete time low-pass filter to obtain a filtered value of the samples of available bandwidth.

3> Zhao discloses a routine that implements a discrete time low-pass filter to obtain a filtered value of the samples of available bandwidth [abstract | column 3 «lines 34-48» | column 4 «lines 8-16» | claim 19]. It would have been obvious to one of ordinary skill in the art to incorporate Zhao's low-pass filtering into Sinha's bandwidth estimation method for the added advantage of smoothing out high frequency traffic from measuring the link capacity of the network as taught by Zhao.

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4> As to claim 3, Sinha does not explicitly disclose the end-to-end bandwidth estimation according to claim 1, wherein the routine implements a discrete time low-pass filter with time-varying coefficients.

5> Zhao discloses a routine implementing a discrete time low-pass filter with time-varying coefficients for estimating bandwidth [column 7 «lines 22-29» | column 8 «lines 50-66» | column 9 «lines 43-58»]. It would have been obvious to incorporate Zhao's time-varying coefficients and low-pass filter into Sinha's bandwidth estimation method for the added advantage of smoothing out high frequency traffic from measuring the link capacity of the network over a period of time as taught by Zhao.

6> As to claim 5, Sinha discloses a method for adapting the amount of data for unit time of time, i.e. the rate, sent by the server to the client over a packet network, comprising an end-to end bandwidth estimation according to claim 1 [see '1 Introduction' | '3.1 Congestion Control (number 3)'].

7> As to claim 6, as it merely is a method that performs the steps of the system of claims 1 and 3, it does not teach or further define over the claims. Therefore, claim 6 is rejected for similar reasons to claims 1 and 3, supra.

8> As to claim 7, Sinha discloses a method for adaptively setting congestion window and slow start threshold in the TCP/IP protocol, comprising an end-to-end bandwidth

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estimation according to claim 1 [see '1 Introduction' | '3.1 Congestion Control' | '3.2 Reliability']].

9> As to claim 8, as it merely is a method that performs the steps of the system of claims 1 and 3, it does not teach or further define over the claims. Therefore, claim 8 is rejected for similar reasons to claims 1 and 3, supra.

10> As to claim 10, as it merely is a method that performs the steps of the system of claims 1 and 3, it does not teach or further define over the claims. Therefore, claim 10 is rejected for similar reasons to claims 1 and 3, supra.

11> As to claim 12, as it is merely a method that performs the steps of the system of claim 1, it does not teach or further define over the limitations of claim 1. Therefore claim 12 is rejected for similar reasons to claim 1, supra.

12> Claims 2 and 17 are rejected under 35 U.S.C § 103(a) as being unpatentable over Sinha and Zhao, in further view of Lai et al, "Measuring Bandwidth" ["Lai"].

13> As to claim 2, Sinha discloses the end-to-end bandwidth estimation according to claim 1, wherein a sample of available bandwidth b_j at time t_j is computed as:

$$b_j = \frac{d_j}{t_j - t_{j-1}}$$

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where d_j is the amount of data that have been received at the receiver or acknowledged at the sender in the interval $t_j - t_{j-1}$, t_{j-1} is the time when the previous ACK was received by the sender or the time when the previous packet was received by the receiver, and t_j is the time when the current ACK is received by the sender or when the current packet is received by the receiver [see '3.1 Congestion Control (number 6: Startup Behavior) where: Sinha does not explicitly disclose the equation but describes computing the bandwidth using the packet-pair approach. The packet-pair approach measures bandwidth of the network and is analogous to the equation of the present claim]. For example, Lai discloses calculating bandwidth using the packet pair method disclosed by Sinha using an equation:

$$b_{bpl} = \frac{s_2}{a_2 - a_1}$$

[see 'IV. Bandwidth Measurement Algorithms - D. Receiver and Sender based Packet Pair]. Therefore it would have been obvious for one of ordinary skill in the art to reasonably infer implementing Lai's bandwidth estimation equation based on packet pairs into Sinha's packet pair method to determine the bandwidth of the network.

14> As to claim 17, as it merely is a method that performs the steps of the method of claim 1 and 2, it does not teach or further define over the limitations of those claims. Therefore, claim 17 is rejected for similar reasons to claims 1 and 2, supra.

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15> Claims 9, 11 and 16 are rejected under 35 U.S.C § 103(a) as being unpatentable over Sinha and Zhao, in further view of Albuquerque et al, "An End-to-End Source-Adaptive Multi-layered Multicast (SMM) Algorithm" ["Albuquerque"].

16> As to claim 9, Sinha discloses end-to-end bandwidth estimation according to claim 1 [see claim 1] but does not explicitly disclose a method for adaptively selecting the quality of coding, or the numbers of layers to be transmitted in a layered coding of an audio/video source using the TCP protocol, or the UDP protocol, or the RTP protocol.

17> Albuquerque discloses a method for adaptively selecting the quality of coding, or the numbers of layers to be transmitted in a layered coding of an audio/video source using the TCP protocol, or the UDP protocol, or the RTP protocol [abstract | '1 Introduction' | '3 Architecture and Algorithm']. It would have been obvious to one of ordinary skill in the art to incorporate Albuquerque's end-to-end adaptive selection of the quality of coding and the numbers of layers to be transmitted into Sinha's bandwidth estimation system. One would have been motivated to perform such an implementation to increase the functionality of Sinha by allowing Sinha the ability to multicast video over his protocol.

18> As to claim 11, Sinha discloses bandwidth estimation comprising:
a routine to compute samples of available bandwidth by taking into account packets received by the client, if the routine is implemented at the receiver side, or by taking into account acknowledgement packets received by the sender, if the routine is implemented at

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the sender side [see '3.1 Congestion Control (number 4)' | '3.2 Reliability' | '4 The WTCP Algorithm'].

Sinha does not explicitly disclose the other limitations of the method of claim 11.

19> Zhao discloses a routine that implements a discrete time low-pass filter to obtain a filtered value of the samples of available bandwidth over a packet network, comprising an end-to-end bandwidth [abstract | column 3 «lines 34-48» | column 4 «lines 8-16» | claim 19]. It would have been obvious to one of ordinary skill in the art to incorporate Zhao's low-pass filtering into Sinha's bandwidth estimation method for the added advantage of smoothing out high frequency traffic from measuring the link capacity of the network as taught by Zhao.

20> Albuquerque discloses a method for adaptively selecting the quality of coding, or the numbers of layers to be transmitted in a layered coding of an audio/video source according to claim 9, comprising:

increasing step by step the quality of coding, or the numbers of layers to be transmitted in a layered coding of an audio/video source until congestion is experienced by means of control packets [abstract | '1 Introduction' | '3 Architecture and Algorithm' | '4 Video Encoder Rate Control'];

setting the quality of coding or select the numbers of layers to be transmitted after that a congestion episode is signaled by means of control packets [abstract | '1 Introduction' | '3 Architecture and Algorithm' | '4 Video Encoder Rate Control']; and

increasing again step by step the quality of coding or the number of layers to be transmitted in a layered coding to probe for extra available bandwidth [abstract | '1 Introduction' | '2 Sender-Driven vs. Receiver-Driven Adaptation' | '3 Architecture and Algorithm' | '4 Video Encoder Rate Control'].

It would have been obvious to one of ordinary skill in the art to incorporate Albuquerque's end-to-end adaptive selection of the quality of coding and the numbers of layers to be transmitted into Sinha's bandwidth estimation system. One would have been motivated to perform such an implementation to increase the functionality of Sinha by allowing Sinha the ability to adaptively multicast video over his protocol based on the estimate of available bandwidth in the network.

21> As to claim 16, as it does not teach or further define over the limitations of claim 11, it is rejected for similar reasons as claim 11, supra.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dohm Chankong whose telephone number is (571)272-3942. The examiner can normally be reached on 8:30AM - 5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenton Burgess can be reached on (571)272-3949. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DC

A handwritten signature in black ink, appearing to read 'Dung C. Dinh', with a long horizontal stroke extending to the right.

Dung C. Dinh
Primary Examiner